IN THE CLAIMS

The claims are reproduced below for the Examiner's convenience:

1. (Currently Amended) An apparatus comprising:

a processing unit of a processor;

a memory coupled to the processor; and

an instruction set operable on the processing unit of the processor and including instructions:

to instantiate a data structure in the memory to collect a representation of a working set; and

defining a hash unit operable on the processing unit to map a plurality of working set elements into the data structure using a hash function[[.]]

wherein a working set $W(t_i, \tau)$ for i=1,2…, is a set of distinct memory segments $\{s_1, s_2 \ldots s_\omega\}$ accessed over the i^{th} window of size τ.

2. (Previously Presented) The apparatus of claim 1 wherein the data structure is a 2^n x m bit table, where *n* is a number of bit table entries and m is a width of the bit table.

3. (Original) The apparatus of claim 2 wherein m is in the range of 1 to 64.

4. (Original) The apparatus of claim 2 wherein m = 1.

5. (Original) The apparatus of claim 2 wherein n is in the range of 1 to 20.

6. (Original) The apparatus of claim 1 wherein the data structure is a 2^n -bit vector.

7. (Original) The apparatus of claim 6 wherein n = 1.

8. (Currently Amended) A computerized method of creating a representation of a working set, the computerized method comprising:

mapping a plurality of working set elements into fields of a data structure using a hash function[[.]]

wherein the working set $W(t_i, \tau)$ for i=1,2…, is a set of distinct memory segments $\{s_1, s_2 \ldots s_\omega\}$ accessed over the i^{th} window of size τ.

9. (Original) The computerized method of claim 8 wherein the mapping is performed for a fixed interval of program execution.

10. (Original) The computerized method of claim 9 wherein the data structure is reset prior to each fixed interval of program execution.

11. (Original) The computerized method of claim 10 further comprising saving the fields of the data structure prior to resetting the data structure.

12. (Currently Amended) A computerized method of creating a representation of a working set, the computerized method comprising:

executing a program for a fixed interval, the program comprising instructions identified by a program counter;

performing a hash function on the program counter to create a hash value for each instruction executed during the fixed interval; and

updating a field of a table indexed by the hash value wherein the table represents the working set[[.]]

wherein the working set $W(t_i, \tau)$ for i=1,2…, is a set of distinct memory segments $\{s_1, s_2 \ldots s_\omega\}$ accessed over the i^{th} window of size τ.

13. (Currently Amended) A computer system comprising:

a bus;

a memory coupled to the bus; and

a processor coupled to the memory and the bus; the processor comprising:

a data structure to collect a representation of a working set; and

a hash unit to map a plurality of working set elements into the data structure using a hash function[[.]]

wherein the working set $W(t_i, \tau)$ for i=1,2…, is a set of distinct memory segments $\{s_1, s_2 \ldots s_\omega\}$ accessed over the i^{th} window of size τ.

14. (Previously Presented) The computer system of claim 13, further comprising:

an instruction retirement unit; and

wherein the data structure and the hash unit are part of an instruction retirement unit.

15. (Currently Amended) A computerized method of estimating size of a working set, the method comprising:

receiving a signature for a working set; and

estimating the size of the working set based on the size of the signature[[.]]

wherein the working set $W(t_i, \tau)$ for i=1,2…, is a set of distinct memory segments $\{s_1, s_2 \ldots s_\omega\}$ accessed over the i^{th} window of size τ.

16. (Original) The computerized method of claim 15 wherein the estimating is performed with the following function:

$$K = \log(1-f)/\log\left(1-\frac{1}{2^n}\right),$$

wherein K is the number of unique working set elements, 2^n is the number of entries in the signature, and f is the fraction of 1's in the signature.

17. (Currently Amended) A computerized method of detecting working set changes, the method comprising:

comparing a current working set signature to a previous working set signature;

calculating a relative signature distance between the current working set signature and the previous working set signature; and

identify a working set change when the relative signature distance exceeds a predetermined threshold[[.]]

wherein a working set $W(t_i, \tau)$ for i=1,2…, is a set of distinct memory segments $\{s_1, s_2 \ldots s_\omega\}$ accessed over the i^{th} window of size τ.

18. (Original) The computerized method of claim 17 wherein the working set change indicates a phase change in a program.

19. (Currently Amended) A computerized method of identifying a recurring working set, the method comprising:

comparing a current working set signature to one or more previous working set signatures;

calculating a relative signature distance between the current working set signature and the one or more previous working set signatures; and

identifying a recurring working set when the relative signature distance between the current working set signature and one of the previous working set signatures is within a predetermined threshold[[.]]

wherein a working set $W(t_i, \tau)$ for i=1,2…, is a set of distinct memory segments $\{s_1, s_2 \ldots s_\omega\}$ accessed over the i^{th} window of size τ.

20. (Original) The computerized method of claim 19 further comprising identifying a new working set when the relative signature distance between the current working set signature the one or more previous working set signatures exceeds a predetermined threshold.

21. (Original) The computerized method of claim 20 further comprising maintaining a table of the one or more previous working set signatures.

22. (Currently Amended) A hardware reconfiguration method comprising:

maintaining a table comprising a plurality of working set signatures for a program;

upon detecting a working set change, looking up a working set signature for a current working set in the table;

if the working set signature is in the table, reinstating a hardware configuration for the current working set; and

if the working set signature is not in the table; identifying a new hardware configuration for the current working set and saving the working set signature and the new hardware configuration[[.]]

wherein a working set $W(t_i, \tau)$ for i=1,2…, is a set of distinct memory segments $\{s_1, s_2 \ldots s_\omega\}$ accessed over the i^{th} window of size τ.

23. (Original) The method of claim 22 wherein the working set change indicates a phase change in a program.